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Università Cattolica del Sacro Cuore

Title: Hybrid coracoclavicular and acromioclavicular reconstruction in chronic acromioclavicular joint dislocations yields good functional and radiographic results

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The authors declare that they have no conflicts of interest



HYBRID CORACOCLAVICULAR AND ACROMIOCLAVICULAR RECONSTRUCTION IN CHRONIC ACROMIOCLAVICULAR JOINT DISLOCATIONS YIELDS GOOD FUNCTIONAL AND RADIOGRAPHIC RESULTS

INTRODUCTION

- Optimal treatment of chronic unstable acromioclavicular (AC) joint dislocations (type III-V according the Rockwood classification) is still debated.
- Anatomic coracoclavicular (CC) reconstruction is a reliable option in terms of two-dimensional radiographic reduction, clinical outcomes, and return to sports, but there remain concerns regarding anterior-posterior stability of the AC joint with CC ligament reconstruction alone.

AIM

- The aim of the present study was to describe the mid-term results of a new hybrid technique with CC and AC ligament reconstruction for chronic AC joint dislocations.



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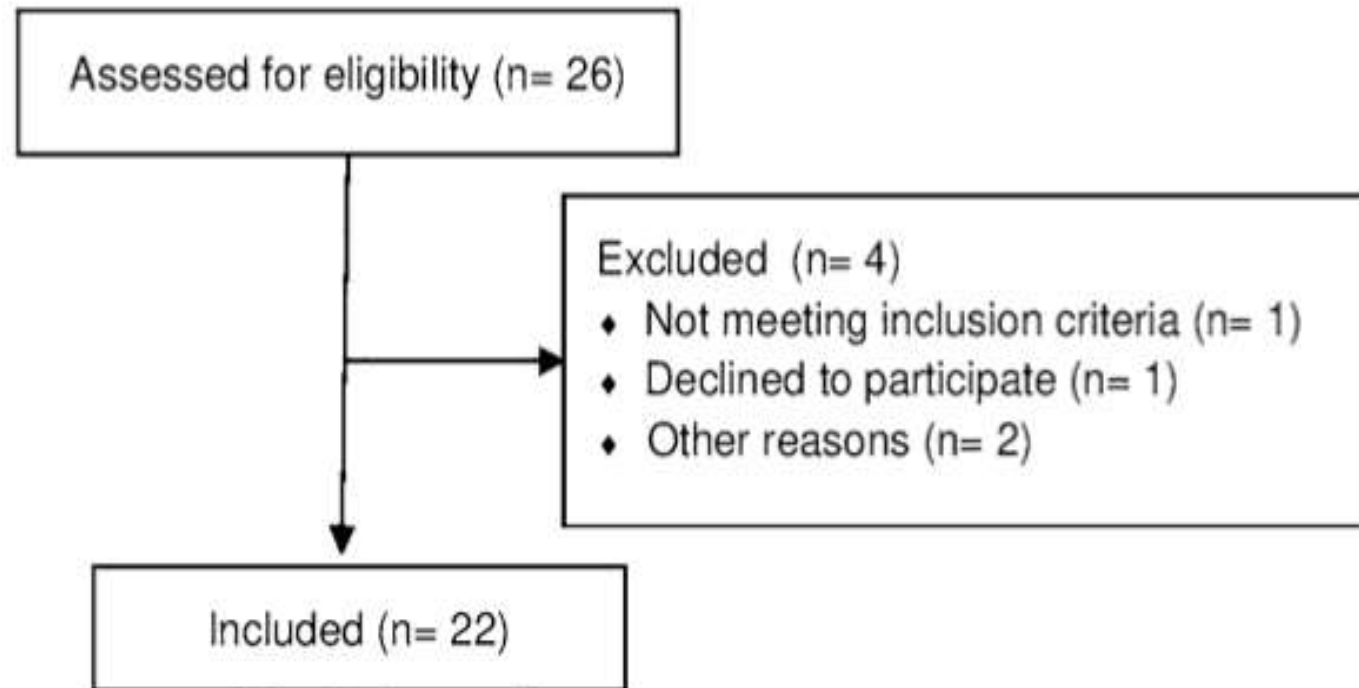
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METHOD

- Twenty-two patients surgically treated for chronic AC joint dislocations (grade 3 to 5) were retrospectively reviewed.
- All patients were assessed before surgery and at final follow-up with the Constant-Murley score (CMS) and the American Shoulder and Elbow Surgeons (ASES) score.
- The CC vertical distance (CCD) and the CCD ratio (affected side compared to unaffected side) were measured on Zanca radiographs preoperatively, at 6 months postop and at final follow-up.
- The same surgical technique consisting in a primary fixation with a suspensory system, coracoclavicular ligaments reconstruction with a double loop of autologous gracilis and acromioclavicular ligaments reconstruction with autologous coracoacromial ligament was performed in all cases.



PRISMA Flow Chart



Demographic baseline

Table 1 Baseline characteristics

Total no	22 patients	
Age (y), mean \pm SD (range)	34.4 \pm 9 (19–58)	
<i>Gender, n (%)</i>		
Male	19 (86.3)	
Female	3 (13.6)	
<i>Side, n (%)</i>		
Right	13 (59)	
Left	9 (41)	
Dominance, <i>n (%)</i>	14 (63.3)	
<i>Injury, n (%)</i>		
Motor vehicle	5 (22.7)	
Fall	1 (4.5)	
Sports	16 (72.7)	
<i>Rockwood, n (%)</i>		
3	5 (22.6)	
5	17 (77.2)	
Time to surgery (days), mean \pm SD (range)	53.4 \pm 36.7 (26–180)	
<i>Sport activities pre-op, n (%)</i>	Leisure	Semipro
Soccer	5 (22.7)	3 (13.6)
Basketball	1 (4.5)	1 (4.5)
Tennis	1 (4.5)	
Swimming	2 (9.1)	
Volleyball	1 (4.5)	1 (4.5)
Judo	2 (9.1)	
Bicycle	4 (18.5)	
Golf	1 (4.5)	

Y years, *SD* standard deviation, *n* number

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RESULTS

- Twenty-two shoulders in 22 patients (19 males and 3 females) were evaluated with a mean age of 34.4 ± 9 years at the time of surgery.
- The mean interval between the injury and surgery was 53.4 ± 36.7 days.
- The mean duration of postoperative follow-up was 49.9 ± 11.8 months.
- According to the Rockwood classification, there were 5 (22.6%) type-III and 17 (77.2%) type-V dislocations.
- Mean preoperative ASES and CMS were 54.4 ± 7.6 and 64.6 ± 7.2 , respectively.
- They improved to 91.8 ± 2.3 ($p = 0.0001$) and 95.2 ± 3.1 ($p = 0.0001$), respectively at final FU.
- The mean preoperative CCD was 22.4 ± 3.2 mm while the mean CCD ratio was 2.1 ± 0.1 .
- At final FU, the mean CCD was 11.9 ± 1.4 mm ($p = 0.002$) and the mean CCD ratio was 1.1 ± 0.1 ($p = 0.009$).
- No recurrence of instability was observed.
- One patient developed a local infection and four patients referred some shoulder discomfort.
- Heterotopic ossifications were observed in three patients.



Clinical and radiographic outcomes

	Baseline	Follow-up (6 months)	Follow-up (final)	<i>p</i> value
ASES score	54.4 ± 7.6	–	91.8 ± 2.3	0.0001*
CMS	64.6 ± 7.2	–	95.2 ± 3.1	0.0001*
CCD (mm)	22.4 ± 3.2	10.2 ± 0.9	11.9 ± 1.4	0.002*
CCD ratio	2.1 ± 0.1	0.9 ± 0.01	1.1 ± 0.09	0.009*
CCD healthy	10.2 ± 3.3	–	10.3 ± 3.2	n.s



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Fig.1

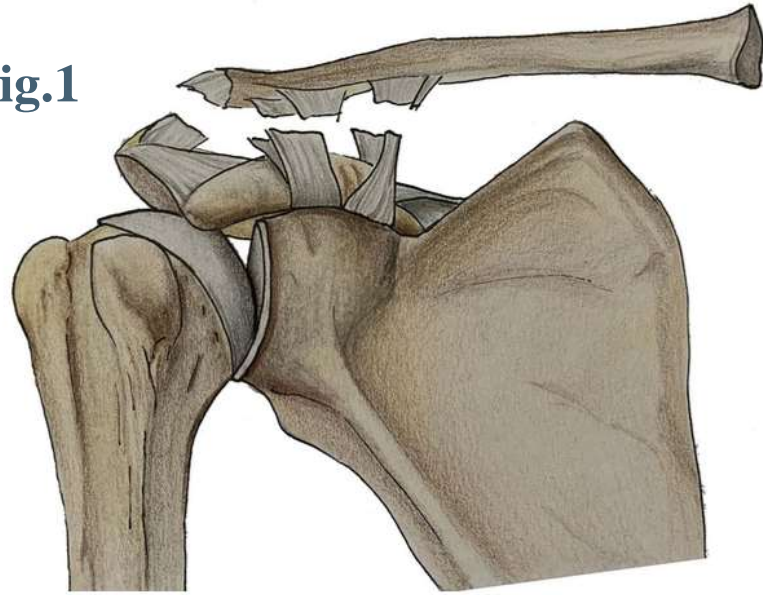


Fig.2

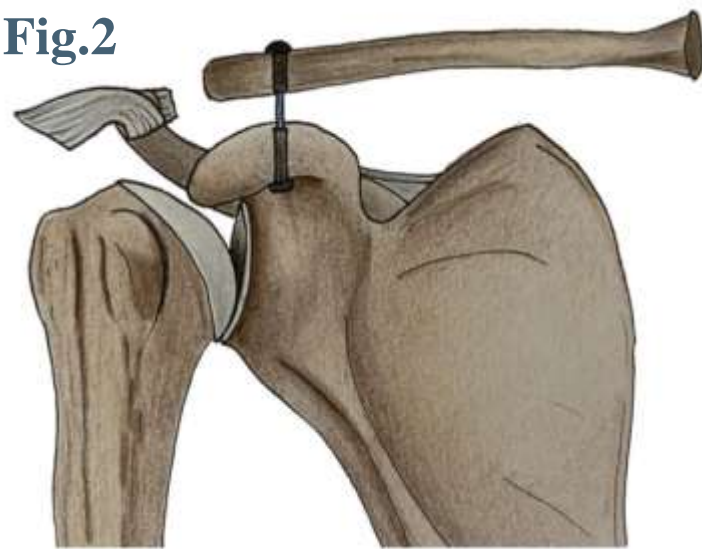


Fig.1 The CA ligament is detached from the lateral aspect of the coracoid and prepared as a graft to reconstruct the AC ligaments.

Fig.2 Two 4-mm tunnels in the clavicle and in the coracoid are drilled and the AC joint is reduced under direct visualization using the Tigtrope system.

Fig.3

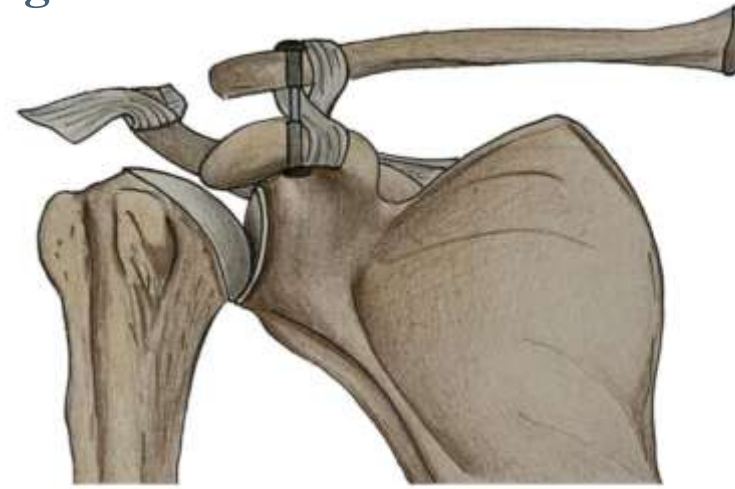


Fig.4

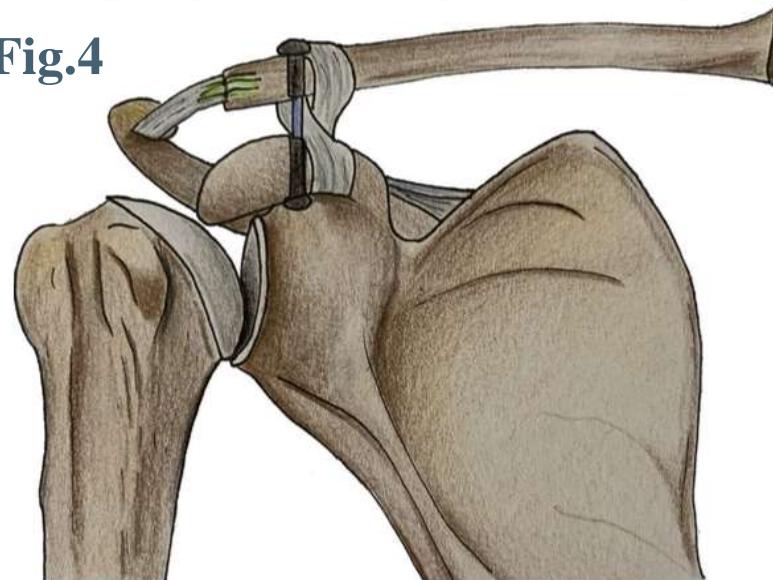


Fig.3 The free ends of the gracilis tendon are passed around the clavicle and coracoid in a figure-of-8 configuration, pulled together and then sutured to the underlying loop with #2 Vicryl stitches.

Fig.4 The sutures from the CA ligament are passed into the small tunnels through the distal clavicle and tied together.

Fig.5



Fig.6



Fig.5 Preoperative X-Ray of a chronic acromioclavicular joint dislocations.

Fig.6 Postoperative X-Ray after hybrid coracoclavicular and acromioclavicular reconstruction.



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CONCLUSIONS

- The optimal treatment of chronic high-grade AC joint dislocations requires superior-inferior and anterior-posterior stability to ensure good clinical outcomes and return to overhead activities or sports.
- The present hybrid technique of AC and CC ligaments reconstruction showed good clinical and radiographic results and is a reliable alternative to other reported techniques.



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